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Agriculture development, food security and nutrition

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Report of the Secretary-General

Summary

Nearly 800 million people around the world are undernourished and global nutrition challenges are increasingly complex. Most countries are burdened by multiple forms of malnutrition, including stunting, wasting, underweight, micronutrient deficiencies, overweight and obesity, which may coexist within the same country, household or individual.[1] Meeting the dietary needs of future populations will require the sustainable doubling of agricultural productivity and the mitigation of the effects of climate change, the reduction of food loss and waste and the adoption of healthy diets worldwide in order to ensure lasting success in eradicating extreme poverty and hunger.

* A/71/100.

[1] See Food and Agriculture Organization of the United Nations (FAO), *The State of Food and Agriculture: Food Systems for Better Nutrition* (Rome, 2014).

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I. Introduction

1. In its resolution 70/223 on agriculture development, food security and nutrition, the General Assembly requested the Secretary-General to report to the Assembly at its seventy-first session on the implementation of the resolution and called upon the relevant organizations of the United Nations system, under their respective mandates and resources, to ensure that no country is left behind.

2. In the present report efforts to achieve the internationally agreed goals on agriculture development, food security and nutrition are outlined, as are the way in which those efforts are being aligned in accordance with the transformative vision of the 2030 Agenda for Sustainable Development[2] (see General Assembly resolution 70/1) and its call to leave no one behind. The report has been informed by numerous contributions, including from the Food and Agriculture Organization of the United Nations (FAO), the World Food Programme (WFP), the secretariat of the Committee on World Food Security, the coordination team of the High-level Task Force on Global Food and Nutrition Security, the United Nations Standing Committee on Nutrition, the United Nations Children's Fund (UNICEF), the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (OHRLLS), the Office of the United Nations High Commissioner for Human Rights (OHCHR), the United Nations Commission on Trade and Development (UNCTAD), the United Nations Industrial Development Organization (UNIDO), the Economic and Social Council for Western Asia (ESCWA), the International Trade Centre (ITC), the Institute for Integrated Management of Material Fluxes and of Resources, the International Telecommunication Union (ITU), the International Atomic Energy Agency (IAEA) and the UN Office for Outer Space Affairs.

II. Overview

3. The number of people directly impacted by malnutrition is staggering: about 2 billion suffer from micronutrient deficiencies, 159 million children under the age of five are stunted (i.e., of low height for their age) and 51 million children of the same age are wasted (i.e., of low weight for their height).[3] While there has been progress in addressing undernourishment, with a reduction from over one billion people in the period from 1990 to 1992 to 780 million people in the period from 2014 to 2016,[4] the goal of eradicating hunger is far from reach. Without a firm political and societal commitment, large segments of the population will remain undernourished in 2030, particularly in Sub-Saharan Africa and South Asia.[5] In addition, 41 million children under the age of 5 and 1.6 billion adults are

[2] See resolution 70/1.

[3] See UNICEF — World Health Organization (WHO) — World Bank Group, *Levels and trends in child malnutrition: joint child malnutrition estimates* (2015).

[4] See FAO, International Fund for Agricultural Development (IFAD), World Food Programme (WFP), *The State of Food Insecurity in the World: Meeting the 2015 International Hunger Targets: Taking Stock of Uneven Progress* (2015), available from www.fao.org/3/a-i4646e.pdf.

[5] See FAO, IFAD and WFP, *Achieving Zero Hunger: the Critical Role of Investments in Social Protection and Agriculture*, 2nd ed. (Rome, 2015), available from www.fao.org/3/a-i4951e.pdf. See also: "World agriculture towards 2030/2050".

overweight or obese, indicating that, while the world must hasten progress to reduce undernutrition, the growing triple burden of malnutrition (undernourishment, micronutrient deficiency and obesity) is impossible to ignore.

4. The challenges of ensuring food security and nutrition are compounded by a changing global environment, characterized by movements of population, rapid urbanization and changing lifestyles, as well as limited natural resources and climate change. Competition over natural resources for food and non-food is not new, but the nature and the intensity of the competition has changed significantly during the past decade, driven by the intensification of human activities, with increasing pressures on land, water, biodiversity, energy and nutrients.

5. Ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture are central to the 2030 Agenda and its Sustainable Development Goals.[2] Some 72 countries met the Millennium Development Goal to halve hunger by 2015, indicating that fully eradicating hunger by 2030 is achievable. However, while the Goals addressed a limited set of economic and social issues, the Sustainable Development Goals comprise 17 Goals and 169 targets covering a wide range of issues that offer a more integrated paradigm for sustainable and equitable development, and provide a clear call to action that reaffirms the vision of universal peace and prosperity established by the United Nations 70 years ago.

6. The 2030 Agenda applies to all nations, with the aim of leaving no one behind, and placing the furthest behind first. Many Sustainable Development Goals and targets explicitly reflect the content of human rights standards, including access for all to safe, nutritious and sufficient food; safe and affordable water, sanitation, hygiene and housing; universal health coverage; free, equitable and quality primary and secondary education; and safe, effective, quality and affordable essential medicines and vaccines.

7. The relationships between Sustainable Development Goal 2 and the other Goals illustrate the fundamental role of agriculture, food security and nutrition in the 2030 Agenda. Goal 2 and its targets are inherently connected to almost all other Goals: food security strongly depends on soil (quality and resilience: Goal 15), water (renewability, availability, quality: Goal 6), energy (supply, price and dependability: Goal 7), climate (optimal temperature and moisture regimes and a low frequency of extreme events: Goal 13) and economic growth (income and access to resources: Goals 8 and 9), as well as consumption and production patterns (Goal 12), gender equality (Goal 5) and political stability (peace and harmony: Goal 16).[6]

III. Ending hunger and malnutrition: Sustainable Development Goal targets 2.1 and 2.2

8. Addressing malnutrition in all its forms requires integrated action across sectors, including complementary interventions in food systems, public health and education. Food systems have the primary role of providing physical and economic access to safe, nutritious and sufficient food. This requires that consumers'

[6] See Mathew Kurian and Reza Ardakanian, eds., *Governing the Nexus: Water, Soil and Waste Resources Considering Global Change* (Switzerland, Springer, 2015).

nutritional needs be considered in all steps of the food chain — from production, post-harvest handling, processing and retail to consumption.

9. An increasing number of countries — in particular in Africa, Asia and Latin America — are developing explicit strategies to mainstream nutrition and the promotion of healthy diets in their food and agriculture policies and investment plans. Nutrition is given greater prominence in regional development strategies, such as the Malabo Declaration of the African Union on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, the Association of Southeast Asian Nations (ASEAN) Food Security and Nutrition Strategy and the Hunger Free Latin America and the Caribbean Initiative. These strategies all emphasize the importance of investing in agriculture, diversifying food production and diets and providing quality nutrition education to consumers; introducing labour-saving technologies in food production and processing; enhancing women's access to income; and improving food safety at all stages of the food chain.

10. National Governments are investing in the capacity development of professionals in the food and agriculture sector, including agricultural extension workers and farmers' organizations, and, increasingly, are exploring opportunities to promote healthy diets through the regulation of marketing and the creation of price incentives for healthy foods and disincentives for unhealthy foods. They are supported by development partners and international finance institutions, which are paying more attention to the nutritional impacts of their investments in food and agriculture.

11. Despite increased awareness and political commitment, effort is needed to transform political commitment into action. Investments in institutional capacities, including monitoring and evaluation to support evidence-based decision-making, are imperative, as is knowledge exchange among countries on innovative solutions for promoting healthy diets.

12. Women are integral to alleviating hunger and malnutrition because they are primarily responsible for ensuring that food for their families is reliably available, accessible and nutritionally balanced. Households headed by women may not be able to access food of adequate quality and quantity owing to women's relatively lower earnings as compared with men. In poor households, women are often less likely to get the nutrients they need, including managing the physical demands of pregnancy and breastfeeding.

13. Owing to the limitations of national and global data sets, there is very little information on the gender dimensions of hunger. Data gaps pose a major obstacle to gender analysis and the monitoring of food and nutrition security. Sex-disaggregated data are collected at the national level only on a limited number of internationally comparable indicators, such as body mass, weight and certain micronutrient deficiencies.

14. The 2030 Agenda incorporated six internationally agreed targets addressing global malnutrition set by the World Health Assembly in 2012.[7] the following sections, the current global situation in relation to achieving each of the six targets is described.

[7] See WHA65/2012/REC/1, annex 2.

15. **By 2025, a 40 per cent reduction of the global number of children under the age of 5 who are stunted**: An estimated 24 per cent of the world's children under the age of 5 were stunted in 2014. The global trend in stunting prevalence and the number of children affected is decreasing but not fast enough, particularly in Africa. Between 1990 and 2014, stunting prevalence declined from 39.6 per cent to 23.8 per cent and the number of children affected declined from 255 million to 159 million.[8] Of the 114 countries for which data were available in 2015, 39 are on course to meet this first global nutrition target, as compared with 24 in 2014.[9]

16. **By 2025, a 50 per cent reduction in anaemia in women of reproductive age**: The latest estimates, which date from 2011 show that 29 per cent (496 million) of non-pregnant women and 38 per cent (32.4 million) of pregnant women aged 15 to 49 years were anaemic. The highest prevalence of anaemia was found in south Asia and central Africa. Between 1995 and 2011, the prevalence of anaemia fell by 12 per cent — from 33 per cent to 29 per cent in non-pregnant women and from 43 per cent to 38 per cent in pregnant women. This indicates that progress is possible but at present it is insufficient to meet the second global nutrition target by 2025.[10]

17. **By 2025, a 30 per cent reduction in low birth weight**: The monitoring of this third global nutrition target is facing challenges because many newborns are not weighed at birth. Methodological work is being undertaken by a group comprising representatives from UNICEF, the London School of Hygiene and Tropical Medicine, Johns Hopkins University and the World Health Organization (WHO). An estimated 15 to 20 per cent of all births worldwide (during the period from 2005 to 2010) were recorded with low birth weight (i.e., under 2,500 grams), representing more than 20 million births a year.[11]

18. **By 2025, no increase in childhood overweight**: The worldwide rate of prevalence in the number of overweight children (including obese children) among those under 5 years old was 6 per cent in 2014. The trend in overweight prevalence and in the number of children affected is rising in all regions in the world (most rapidly in Asia), whereby overall the prevalence has gone up between 1990 and 2014, from 4.8 per cent to 6.1 per cent, and numbers affected have risen from 31 million to 41 million. If this trend continues, the number of overweight or obese children globally will rise to 11 per cent (70 million) by 2025.[12]

19. **By 2025, increase the rate of exclusive breastfeeding in the first six months up to at least 50 per cent**: Overall, the breastfeeding rate is not increasing rapidly enough. Surveys conducted during the period from 2007 to 2014 show that an estimated 36 per cent of infants under six months old were exclusively breastfed. Based on these surveys, 33 countries have breastfeeding rates of above 50 per cent and 98 have rates that are below this threshold.[13]

20. **By 2025, reduce and maintain childhood wasting to less than 5 per cent**: Nearly eight per cent (50 million) of children under age five were classified as

[8] See UNICEF-WHO-World Bank Group, *Levels and trends in child malnutrition: joint child malnutrition estimates*, 2015.
[9] See WHO, A/69/7.
[10] See WHO/NMH/NHD/14.4.
[11] See WHO/NMH/NHD/14.5.
[12] See WHO/NMH/NHD/14.6.
[13] See http://gamapserver.who.int/gho/interactive_charts/mdg4/prevention/atlas.html?indicator=i0.

wasted in 2014; an estimated 16 million of these were severely wasted. Globally, more than half these children live in the South Asia region.[14]

IV. Doubling the agricultural productivity and incomes of small-scale food producers: Sustainable Development Goal 2, target 2.3

21. Small-scale food producers account for a large proportion of global agriculture and food production. Farmers operating two hectares of land or less manage only 12 per cent of total agricultural land, but they produce more than 80 per cent of the world's food in terms of value. Most smallholder farmers are found in Asia (75 per cent), while 9 per cent are in Sub-Saharan Africa, 7 per cent in Europe and Central Asia, 4 per cent in Latin America and the Caribbean and 3 per cent in the Middle East and North Africa.

22. Past development efforts in agriculture have led to major improvements in productivity, making it possible to feed a growing global population with relatively limited expansion of agricultural land. Progress has not been the same everywhere, however, and has often been accompanied by social and environmental costs that reduce impact and threaten sustainability. Agricultural development is, by definition, unsustainable if it fails to benefit those whose livelihoods depend on it by increasing their access to resources and assets, their participation in markets and their integration into the value chain.

23. Solutions exist for the progressive development of more sustainable and productive agriculture. Research and innovation provide technical ingredients for change and better understanding of ecosystem functions and services. Technologies and approaches exist for improving soil health and enhancing carbon sequestration, more efficient use of water and energy, efficient food supply chains, the reduction of food loss and waste and the conservation of biodiversity.

24. Land is a source of livelihood, impacts human and economic rights and is often tied to social and cultural identities and rights. Disputes over land are frequently the cause of violent conflict, which negatively affects poverty reduction efforts, development, peacebuilding, humanitarian assistance, disaster prevention and recovery and urban and rural planning. Emerging global issues, such as food insecurity, climate change and rapid urbanization, have also refocused attention on how land is being used, controlled and managed by States and private actors.

25. The extent to which rural populations have secure and equitable access to the natural resources they need to produce food for their consumption and to increase income is critically important — their livelihoods are often based on access to and control over land, water, forest and fishery resources. Inadequate and insecure tenure rights to natural resources frequently result in extreme poverty and hunger. Conversely, secure land tenure usually results in enhanced investment by farmers, higher yields and reduction in soil degradation.

26. The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, endorsed by the Committee on World Food Security in 2012, represent a global framework on tenure

[14] See UNICEF, WHO, World Bank, *Levels and trends in child malnutrition*.

governance through a multisectoral perspective, addressing aspects related to customary tenure rights, markets, investment, taxation, climate change, natural disasters, conflicts and dispute resolution. The Voluntary Guidelines are directly relevant to at least 14 targets under the Sustainable Development Goals and build on the potential offered by technology and innovation, such as regulated special planning for sustainable management of land, fisheries and forests.

27. The Voluntary Guidelines support the work of many multilateral organizations worldwide and have given rise to Government-to-Government initiatives through bilateral and South-South cooperation, Government-to-civil society organization partnerships and partnerships among Governments, civil society organizations and private sector companies. Partners are coordinating with global and regional platforms involved in land issues, such as the Global Donor Working Group on Land and the Global Land Tool Network, of the United Nations Human Settlements Programme (UN-Habitat) to promote the implementation of the Voluntary Guidelines and assess their implementation within the framework of the Sustainable Development Goals. In this context, capacities are being strengthened in countries to link the Voluntary Guidelines and the African Land Policy Initiative framework and guidelines on land policy in Africa and, at the pan-African level, to promote effective land policies to provide equitable and secure access to land in order to accelerate the achievement by countries of the interrelated targets of the 2030 Agenda.

28. On average, women make up about 45 per cent of the agricultural labour force in developing countries, and they are heavily involved in food and cash crop production. Nevertheless, often as a result of local traditions and sociocultural factors, women across all regions have less access than men to productive resources and opportunities related to land, livestock, labour, technology, education, extension, financial services and decision-making. Most land tenure regimes in both developed and developing countries are characterized by strong gender disparities in land distribution, high asymmetry of power, weak land governance structures, mixtures of different, uncodified customary rules, values and practices on tenancy and management arrangements; and conflicting religious, statutory and legal arrangements.

29. Improving responsible land governance requires a fundamental change in the way gender is perceived and in mainstreaming of governance work from the field to the policy levels. Efforts are being devoted to designing gender-responsive policy instruments and incentives to improve women's access to natural resources and services by enhancing their leadership and technical skills; increasing their access to markets and agri-food value chains; and developing labour-saving and productivity enhancing technologies.

30. The gender gap in land rights can be reduced by strengthening women's land rights through legal reform, joint titling and land certification programmes; transferring land to women through redistributive land reform, microplots and collective plots; increasing their representation and decision-making in formal and informal land-related institutions, including administration bodies; and developing legal literacy programmes. However, increasing women's participation and decision-making in territorial and landscape development will require wider collection and analysis of sex-disaggregated data to produce the necessary evidence

base to design effective and inclusive policies and programmes and monitor the impact of development interventions on men and women in the agriculture sector.

31. The broad aim of participatory development is to increase the involvement of socially and economically marginalized people so that no one is left behind. However, interventions related to supply chain support are often lacking in continuity and are scattered. Transformation of productivity requires a holistic approach to value-chain development, bringing all actors together through value-chain development platforms, focusing on a multilayered view of value addition, with a strong emphasis on small and medium-sized enterprise development. Agribusiness should enable community participation for stronger and more inclusive supply chains that eliminate unequal power relationships by allowing small-scale farmers and processors to be integrated in local and regional markets and ensuring that their rights are protected and promoted.

32. A competitive agro-industry can serve as a platform for inclusive and sustainable development that creates jobs, fosters inclusive and broad-based growth and diversifies the product consumption base. It will allow the pursuit of social and economic empowerment for vulnerable groups, improving their access to food and their resilience, and thereby enabling them to produce more food for their needs and for others as an additional source of income.

33. Working along the food supply chain, agribusinesses have the potential to address inequalities and meet pro-poor objectives. Stronger linkages between farmers and agro-industry and the promotion of clusters and consortia can improve food and social security, increase the real incomes of farmers, farm workers and their families, improve access to local and global markets, enhance supply-chain efficiencies and contribute to reduction of physical losses.

34. In order to improve productivity, emphasis needs to be placed on developing cooperatives, farmers' and business associations, scientific organizations and women's associations that explicitly support the needs of small-scale agricultural producers and entrepreneurs and capture and add value to on-farm, post-harvest and off-farm enterprises. They are an important prerequisite to assist small-scale farmers, who produce sustainably without sacrificing yield, to overcome high marketing costs and to harness market potential.

V. Ensuring sustainable food systems: Sustainable Development Goal 2, target 2.4

35. Ending hunger by 2030 depends on halting land degradation, deforestation and desertification, and conserving and restoring terrestrial ecosystems such as forests, wetlands, drylands and mountains by 2020. There is a need for sustainable, resilient farming practices that increase smallholder farmers' productivity as well as off-farm employment and planned migration activities supporting food access that take pressure off the land, while addressing the challenges potentially affecting food security. Additionally, with land uses, food systems and the provision of ecosystem services increasingly being influenced by urbanization trends, rural prosperity and sustainable rural-urban territories are increasingly being understood as being an integral part of sustainable urbanization.

36. Solutions to sustainable food production must involve a multifunctional land-use system that produces more biomass based on a given sustainable productivity of land and resources.[6] Agroforestry practices successfully demonstrate multifunctionality by harmonizing secure food production and high environmental resilience, for example by introducing fertilizer trees into a cultivated system or by using soil conservation hedgerows to minimize soil erosion. Similarly designed agro-systems can provide not only agricultural goods but also other ecosystem services for local and neighbouring areas by ensuring the maintenance of productive resources and inputs. A nexus approach to water resources management can mitigate and improve water, vegetation and soil resources, while taking the changing environmental and socioeconomic conditions into consideration.

37. Agriculture and food systems are both victims and drivers of climate change. Agricultural land use and deforestation are responsible for 20 to 30 per cent of atmospheric greenhouse gas accumulations. In turn, the effects of climate change undermine the agricultural livelihoods of the world's poor. Shifting to more sustainable agriculture and food systems will be increasingly necessary to strengthen resilience to the effects of climate change and to ensure food security.

38. The outcome of the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Paris in 2015, highlighted the adverse impact of climate change on food security. The Paris Agreement under the United Nations Framework Convention on Climate Change underlines the links between safeguarding food security and ending hunger and the impacts of climate change. Around 90 per cent of countries have included consideration of the agriculture sector in their nationally determined contributions to climate change. Sustainable agricultural and land use practices deliver a triple win — they improve the productivity of small-scale farmers, rural livelihoods and nutrition; they build resilience to climate change; and they reduce emissions and increase carbon stocks. A systematic transformation of agricultural and food policies is required to ensure that they are people-centred and climate-compatible. Significant knowledge gaps will require continuing studies of weeds, pests and diseases, including animal diseases, in response to climate change.

39. With growing awareness that nutrition is central to achieving the Sustainable Development Goals, dietary patterns are increasingly appraised not only on the basis of their health-promoting characteristics, but also on their ability to mitigate climate change. Different dietary patterns drive different production systems and have different emission and resource footprints.[15] Increasing, evidence suggests that dietary patterns that have low environmental impacts are often consistent with good health.[16]

40. Resilience-building work with Governments and partners has reflected a number of critical factors for success. These include: a clear understanding of local contexts, landscapes and livelihoods in order to position interventions well; strong ownership as a result of putting communities and people, including women and

[15] See International Food Policy Research Institute, *Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development* (Washington, D.C., 2015), p. xxv, available from https://www.ifpri.org/publication/global-nutrition-report-2015.

[16] See FAO, *Plates, Pyramids, Planet: Developments in National Healthy and Sustainable Dietary Guidelines: a State of Play Assessment* (2016), available from www.fao.org/3/a-i5640e.pdf.

vulnerable groups, at the centre of planning; and integrating gender, protection and nutrition into all levels of programme design, implementation and monitoring.

41. Given the scale of needs, climate resilience and disaster risk reduction programming has been a priority area for innovation over the last three years. New approaches have been tested and are being scaled up. For example, the Food Security Climate Resilience Facility pilot, which provided financial support to 1,000 households in Guatemala and Zimbabwe to prepare for and reduce the potential impacts of El Niño, is the first institutional mechanism to use climate forecasts to trigger action at the community level before climate shocks occur. A cost-benefit analysis of the facility in Niger and the Sudan indicated that early action based on climate-triggered forecasts would reduce the cost of emergency responses by 50 per cent.

42. Soil degradation and water scarcity are also major constraints to sustaining and enhancing global food production. Intensified cultivation of crops for energy and food has led to the removal of natural resources at a higher rate than that at which they can be replenished. The overextraction of resources leads to significant vegetation and soil degradation, soil nutrient depletion and water supply deficiency in wells and rivers, which results in a further decline in the production of organic matter capable of generating energy (biomass). This vicious cycle damages environmental health and threatens food security.[17]

43. Sustainably increasing agricultural production calls for efforts to manage both soil and water resources in an integrated manner, while also including water and nutrients from safe organic waste, such as sewage sludge, compost and wastewater, in the biomass production cycle.[18] As well as providing the medium for plant growth and food production, soil is essential to the supply of clean water and for resilience to flood and drought. Soil is also the largest store of terrestrial carbon. Its preservation contributes to climate change adaptation and mitigation, while its erosion can lead to the damage or even destruction of infrastructure. Proper defence and management of soil therefore have implications for the achievement of Sustainable Development Goals 2, 6, 13 and 15.

44. In the fisheries sector, small-scale producers play a key role in ensuring food security and eradicating poverty. Small-scale fishers supply nearly half of all global seafood supply, but remain disadvantaged in terms of access to markets and resources. Overall development of the fisheries sector, as well as increased pressure from other sectors (e.g. tourism, aquaculture, agriculture, energy, mining, industry, infrastructure developments) with stronger political or economic influence has contributed to a decline in aquatic resources and to threats to aquatic habitats, ecosystems and the sustainable livelihood of small-scale fisheries communities. Global catch from wild fisheries has been flat, or declining, for 30 years. Aquaculture, which has made up the deficit by growing at a compounded rate of 9 per cent, currently provides about half of all consumed seafood products and it is expected to account for 60 per cent of global seafood consumption by 2030, if not earlier.

[17] See Hiroshan Hettiarachchi and Reza Ardakanian (eds.), *Environmental resource management and the Nexus Approach: Managing Water, Soil, and Waste in the Context of Global Change* (Switzerland, Springer, 2016).

[18] See http://flores.unu.edu/good-practice-examples-and-future-research-needs/.

45. Changes in global and regional climate will interact with many other factors that govern the distribution and ecology of resources and influence the capacity and performance of the marine fisheries sector to meet future consumption rates. For both marine and inland fisheries, the challenge is to sustainably managing fish stocks and ecosystems within a dynamic environment, subject to climate fluctuations and change, in such a way as to maximize harvests without compromising future yields and ensure the fair distribution of benefits, in particular for small-scale producers, given that over 90 per cent of those who are directly dependent on commercial capture fisheries value chains work in the small-scale fisheries subsector. This requires, in particular, the empowerment of small-scale fishing communities to participate in decision-making processes and to assume responsibility for the sustainable use of fishery resources.

46. There is an increasing focus on the role of fish in nutrition and food security through follow-up to the International Conference on Nutrition, as well as the recent endorsement by the FAO Committee on Fisheries of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication.

47. In the context of sustainable food production systems, food loss and waste continues to be a serious concern, but is also an opportunity for action that can have a significant effect on the sustainability of food systems. Global food loss and waste is a major contributor to climate change and accounts for around 8 per cent of total global greenhouse gas emissions (3.6 gigatonnes of CO_2-eq/yr plus 0.8 gigatonnes of CO_2-eq/yr from land use change). Nearly 30 per cent of the world's agricultural land is currently occupied to produce food that is ultimately never consumed by people. Expressed in terms of energy usage, 38 per cent of total energy consumption in global food systems is utilized to produce food that is ultimately lost or wasted.

48. Although the increasing trend towards more processed foods leads to more waste at processing level, this trend could also be seen an opportunity to reduce waste and losses. For example, only 50 per cent of industrially processed fish ends up as food, but through simple and innovative technology, micronutrients from parts of bigger fish considered waste are being made available for human consumption at a low cost, raising levels of micronutrients such as iron, zinc and calcium.

49. Food processing can increase the resilience of vulnerable groups to external shocks by significantly building on financial, human, physical and social capital. Interventions during the collection (post-harvesting) and processing stage of the supply chain can have a significant impact on food security by:

(a) Adding value to raw materials, with the potential to increase the income of small-scale food processors and increase farmers' returns on their produce;[19]

(b) Using a variety of local foods, contributing to the local economy and to the independence, self-sufficiency and food sovereignty of the country;

(c) Providing off-farm employment and diversifying the livelihoods of vulnerable groups;

[19] See Stephen Morse, Nora McNamara and Moses Acholo, "Sustainable Livelihood Approach: A critical analysis of theory and practice", Geographical Paper No. 189 (Department of Geography, University of Reading, United Kingdom, 2009), available from www.reading.ac.uk/web/FILES/geographyandenvironmentalscience/GP189.pdf.

(d) Increasing food availability at household and community levels by decreasing post-harvest and stock losses;

(e) Increasing access to food by the urban and rural poor — post-harvest grain losses in sub-Saharan Africa could total $4 billion per year, for example, and the lost food could meet the minimum annual food requirements of at least 48 million people;[20]

(f) Targeting food seasonality and perishability problems by improving shelf life, thereby contributing to the availability of food at the community level;

(g) Providing a platform for the creation of unions and cooperatives while promoting and strengthening a unified voice for different vulnerable groups by means of technologies, infrastructure and knowledge

VI. Maintaining agricultural genetic diversity, promoting access and benefit sharing: Sustainable Development Goal 2, target 2.5

50. In addition to efforts to increase agricultural productivity and eradicate hunger, there is an increasing effort to abate the long-term consequences of biodiversity loss. Crop genetic diversity is essential for strengthening resilience in agriculture and for preventing wide-scale crop devastation due to changing environmental conditions. However, loss of biodiversity through human activity has accelerated over the past 50 years — up to 75 per cent of the genetic diversity of crops has already disappeared and a mere 40 crops now provide 95 per cent of global food energy needs, while a subset of five cereal crops provide 60 per cent of the global energy intake.

51. The International Treaty on Plant Genetic Resources for Food and Agriculture is the only legally binding international agreement concerning the sustainable management of plant genetic resources for food and agriculture. By promoting the conservation and sustainable use of plant genetic resources, the Treaty addresses the important linkages of sustainable agricultural and natural resource management in the context of climate change.

52. The international regime on access to genetic resources and benefit-sharing underlying Sustainable Development Goal 2, target 2.5, is constituted of the Convention on Biological Diversity, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity, as well as complementary instruments, including the International Treaty on Plant Genetic Resources for Food and Agriculture and the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits arising out of their Utilization.[21]

53. The Multilateral System of Access and Benefit-sharing of the International Treaty on Plant Genetic Resources for Food and Agriculture Multilateral System of Access and Benefit-sharing facilitates the necessary cooperation among countries

[20] See Mo Ibrahim Foundation, "African agriculture: from meeting needs to creating wealth (Tunis, 2011), p. 4.

[21] See UNEP/CBD/COP/10/27, decision X/1.

for the exchange of plant genetic resources for breeding and agricultural research purposes to increase the resilience of agricultural production and promote sustainable agriculture. The Multilateral System currently contains more than 1.8 million crop accessions, and over 3.2 million accessions have been transferred since 2007. Through the Multilateral System, the Treaty contributes to the attainment of Sustainable Development Goal targets 2.5 and 15.6, which are related to the conservation and access and benefit-sharing of genetic resources and aligned with Aichi Biodiversity Targets 13 and 16 (see UNEP/CBD/COP/DEC/X/2, annex, sect. IV). Access and benefit-sharing are also on the agenda for the negotiations on an international legally-binding instrument under the United Nations Convention on the Law of the Sea on marine biological diversity in areas beyond national jurisdiction.

54. As a main benefit-sharing mechanism, the Benefit-sharing Fund of the International Treaty on Plant Genetic Resources for Food and Agriculture is focused on supporting small-scale farmers and local breeders in developing countries in adapting local seeds and crops to changing environmental and social requirements and thereby sustaining their livelihoods. The Fund supports developing-country institutions that develop strategic plans to deal with climate change through the use of genetic diversity and to develop climate-resilient crop varieties. It also supports the development of the capacities of research institutions in the codevelopment and transfer of technologies for biodiversity conservation, breeding and genomic research. Since 2009, over 200 institutions and 40 countries have participated and have been supported in their efforts to develop climate-resilient crops. The Fund is part of the funding strategy of the treaty and has been established as a key mechanism to enhance the availability, transparency, efficiency and effectiveness of the provision of financial resources to implement activities under it.

55. Small-scale family farmers, indigenous food systems and traditional indigenous knowledge contribute fundamentally to the environmental sustainability and genetic preservation of agricultural systems, acting as custodians of a finely-adapted understanding of local ecologies and land capabilities, and sustaining productivity on often marginal lands through complex and innovative land management techniques that combine local knowledge, traditional products and modern technology.

56. In its article 9 on farmers' rights, the International Treaty on Plant Genetic Resources for Food and Agriculture recognizes the efforts and the enormous contribution of farmers to the development and conservation of crop diversity. In it, countries are advised to take measures to, inter alia ensure: the protection of traditional knowledge; the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources; the right to participate in national decision-making on matters related to the conservation and sustainable use of plant genetic resources; and the right to save, use, exchange and sell farm-saved seed. Under the treaty, countries increase their awareness of the importance of farmers' rights and share experience and knowledge with a view to their realization.

VII. Means of implementation

Investment: Sustainable Development Goal 2, means of implementation 2.a

57. The Addis Ababa Action Agenda of the Third International Conference on Financing for Development galvanized the commitment of Member States towards strengthening efforts to enhance food security and nutrition, with particular focus on investment in smallholders and women farmers, as well as on agricultural cooperatives and farmers' networks.[22] The United Nations system has a central role to play in supporting the integration of the recently endorsed Principles for Responsible Investment in Agriculture and Food Systems of the Committee on World Food Security[23] in national policies, legislation and investment plans.

58. The investment landscape is characterized by new sources of funding, including a growing number of private foundations and investment funds. New financing institutions are appearing, such as the Copenhagen Green Climate Fund and development banks, such as the Asian Infrastructure Investment Bank, under the leadership of China, and the New Development Bank operated by Brazil, China, India, the Russian Federation, and South Africa (the BRICS countries).

59. The international financial institutions, notably global and regional development banks, remain an important source of financing in food and agriculture. In 2014, the top three lenders to the public sector in food and agriculture were: the World Bank (over $3 billion); the Asian Development Bank (about $1.26 billion); and the International Fund for Agriculture Development (IFAD) ($713 million). The International Finance Corporation and the European Bank for Reconstruction and Development are the largest lenders to the private sector. They allocate respectively, for food and agriculture, over $1.3 billion and almost $1 billion. There are expectations that agricultural lending by the international financial institutions will continue to rise. For instance, the African Development Bank plans to triple its agricultural investment from $700 million to $2.4 billion a year for the next 10 years, starting in 2017.[24]

60. The Global Agriculture and Food Security Programme, now in its seventh year following its establishment in 2010 to assist in the implementation of pledges by the Group of 20 in 2009, continues to play a significant role in the agricultural investment landscape. To date, the programme has received pledges totalling some $1.3 billion, including $1 billion for its "Public Sector Window" to assist country-led programmes that result from sector-wide country planning exercises such as the Comprehensive Africa Agriculture Development Programme in Africa, and $0.3 billion for its "Private Sector Window", which provides long- and short-term loans, credit guarantees and equity to support private sector activities for agricultural development and food security. A new call for proposals under the programme is anticipated before the end of 2016, with the expectation of the distribution of an additional $150 million.

[22] See resolution 69/313, para. 13.

[23] Available from www.fao.org/3/a-ml291e.pdf.

[24] See FAO, IFAD and WFP, *Achieving Zero Hunger*.

Trade: Sustainable Development Goal 2, means of implementation 2.b

61. The tenth Ministerial Conference of the World Trade Organization, held in Nairobi in December 2015, culminated in the successful conclusion of a ministerial declaration and six ministerial decisions, four of which refer specifically to agriculture: on export competition, on the special safeguard mechanism for developing countries, on public stockholding for food security purposes and on cotton. Importantly, the commitments on export competition provide for the immediate elimination of export subsidy entitlements by developed countries, except for a small number of agriculture products, while developing countries will eliminate these only by the end of 2018 and at a slower pace in certain cases. Concerning other forms of export policies (export credits, food aid and state trading enterprises) the disciplines contained in the decision are less strict, but are also aimed at minimizing the possible distorting impact of such policies on trade.

62. In its decision on public stockholding, the Ministerial Conference reaffirmed the agreement reached previously by WTO in its General Council decision of 27 November 2014, which provides that Members shall refrain from challenging, through the WTO Dispute Settlement Mechanism, compliance of a developing Member with its obligations in relation to trade-distorting domestic support to traditional staple food crops through existing public stockholding programmes for food security purposes. In its decision on special safeguard mechanisms, the Ministerial Conference mandated a programme of work for negotiations on the issue but also reaffirmed that developing countries will have the right to have recourse to such a mechanism.

63. The WTO Trade Facilitation Agreement (see WT/MIN(13)/36 or WT/L/911 and WT/L/940) provides an opportunity to reduce the time and cost of international trade by imposing binding obligations on WTO Members to improve the transparency and efficiency of border procedures. Quick and easy processing of trade transactions is critical to the international competitiveness of businesses, especially in the trade of agricultural products, which are time-sensitive on account of their short shelf life.

Price volatility and food commodity markets: Sustainable Development Goal 2, means of implementation 2.c

64. Urban and rural low-income food consumers are particularly vulnerable to fluctuations in food prices and income, since food makes up a large part of their household expenses — often over 60 per cent. Rapid urban growth and growing urban poverty give rise to concerns about urban food security and supply and distribution systems.

65. A predictable trading environment (as envisaged in Sustainable Development Goal 17, target 17.10) can help to promote long-term investments that could further enhance the productive capacity of a country. The conditions of market access, both foreign market access for a country's exports and domestic market access for imports, are thus an important determinant of the effectiveness of trade as a means of implementation. Tariffs applied to imported goods have been decreasing over time across the developed, developing and least developed countries. Key drivers of

this global trend are the progressive liberalization achieved under the multilateral trading system, as well as the recent expansion of preferential market access under regional trade agreements, unilateral tariff liberalization and non-reciprocal preference schemes.

66. One key mechanism for improving agricultural market transparency is the Agricultural Market Information System, launched by the Group of 20 in 2011 as a multi-agency platform to enhance transparency in international food markets and facilitate the coordination of policies in times of market uncertainty. By working closely with participating countries, the system has improved available market forecasts and policy information, which are accessible to the public through an open database; supported countries in implementing improved methodologies for data collection, analysis and dissemination; provided new insights to better understand and monitor market developments; and promoted policy dialogue and mutual learning among participating countries in the framework of its Global Food Market Information Group and its Rapid Response Forum.[25]

Technology

67. Applying innovative ways to use information and communication technologies (ICTs) in the rural domain with a primary focus on agriculture can boost agricultural and rural development. Improving access to information can help agricultural stakeholders to make informed decisions and use the resources available in the most productive and sustainable manner. In a sector that is becoming increasingly knowledge-intensive, having access to the right information, at the right time, in the right format and through the right channels can make a crucial difference in the livelihoods of people involved in agriculture and related fields.

68. ICTs can offer strong potential for driving economic growth, promoting climate smart agriculture, improving livelihoods and increasing the efficiency of agricultural value chains. ICTs that can be harnessed for e-agriculture include Internet-based applications, sensing tools and data analysis technologies, as well as radio, telephones, televisions, data networks, mobile phones and satellites. Cell-phone-based mobile vulnerability analysis and mapping systems are being used to support decision-making where other forms of data collection are impossible or high-risk. Nuclear technology is often used to evaluate soil degradation and soil losses from erosion, to assess the effectiveness of soil and water conservation strategies and for the remediation of polluted water, soil and air.[26]

69. Satellite imaging systems increasingly provide data and information for the monitoring of agricultural production and early detection of adverse weather conditions and disasters triggered by natural phenomena. In the case of disasters and complex humanitarian emergencies, satellite communications facilitate coordination that is critical for prompt understanding of the extent of damage and for complex planning with respect to food, water and other necessities. Satellite navigation and positioning technology is indispensable for tracking and tracing food security efforts during such devastating events.

[25] See www.amis-outlook.org/.

[26] IAEA has undertaken around 50 national, regional and interregional technical cooperation projects on water and soil management.

VIII. Aligning global efforts with the 2030 Agenda for Sustainable Development

70. The Secretary-General launched the Zero Hunger Challenge at the United Nations Conference on Sustainable Development, held in Rio de Janeiro, Brazil, in 2012. Based around five elements — which taken together would end hunger, eliminate the worst forms of malnutrition and build inclusive and sustainable agricultural systems — the Challenge has brought together different stakeholders to deliver on a common vision and has changed the narrative around hunger from one of despair to positive determination.

71. The Zero Hunger Challenge has united multiple actors around a shared vision of a world free from hunger, malnutrition and rural poverty, achieved through an integrated approach and the transformation of food systems. From May to October 2015, the United Nations system participated in Expo Milano 2015 under the theme "The Zero Hunger Challenge: United for a Sustainable World", highlighting its collaborative efforts to meet the Millennium Development Goals and to foster dialogue and raise public awareness about food security and nutrition, rural development and the sustainable management of natural resources.

72. The integrated and interconnected elements of the Zero Hunger Challenge also served as the inspiration for Sustainable Development Goal 2 of the 2030 Agenda and, since its adoption, the Challenge has been reoriented to be fully aligned with all of the Goals. The five elements of the Zero Hunger Challenge, if integrated into nationally-led Goal implementation strategies, can end hunger and pay dividends across a broad range of other Goals. A total of 167 Member States have expressed commitment to achieving zero hunger, as well as 50 non-State actors and tens of thousands of individuals.

73. During 2014 and 2015, the Secretary-General's High-Level Task Force on Global Food and Nutrition Security, made up of 23 United Nations departments, agencies, funds and programmes and the Bretton Woods Institutions, OECD and WTO, focused its work on supporting the Zero Hunger Challenge. In January 2016, the High-level Task Force on Global Food and Nutrition Security made public a set of advisory notes for action and policy to ensure conceptual coherence, facilitate implementation and monitor progress.

74. In order to respond to the new challenges of the 2030 Agenda and the Paris Agreement under the United Nations Framework Convention on Climate Change, the High-level Task Force on Global Food and Nutrition Security has renewed its terms of reference in order to fully align with the 2030 Agenda. It is focused on exercising political leadership, facilitating convergence and alignment by its 23 members. It will provide high-level policy coordination and coherence in the United Nations system on issues relevant to the achievement of the Sustainable Development Goals related to food and nutrition security and to sustainable agriculture and food systems, creating synergies among entities in supporting implementation at country level and supporting the provision of means of implementation.

75. The high-level political forum on sustainable development is the central platform for the follow-up and review of the 2030 Agenda. It provides political leadership, guidance and recommendations on implementation and follow-up for decision-making informed by science. The theme of the high-level forum's cycle for

2016-2017, "Eradicating poverty and promoting prosperity in a changing world", and will entail an in-depth review of Sustainable Development Goals 1, 2, 3, 5, 9 and 14 at its fifth session in 2017.

76. The Committee on World Food Security is an inclusive intergovernmental committee of the United Nations, which brings together global food security and nutrition stakeholders to enhance coordination and policy convergence towards food security and nutrition for all. Its inclusive processes allow the participation of Governments, civil society organizations, the private sector, the United Nations system, international agriculture research institutes and financial institutions. An independent, multidisciplinary high-level panel of experts informs the discussions.

77. In October 2015, the Committee on World Food Security endorsed the framework for action for food security and nutrition in protracted crises, which addresses the needs of the most vulnerable. The Committee also decided to place the implementation of the 2030 Agenda at the centre of its work, and an open-ended working group on the Sustainable Development Goals was created to identify how the Committee, within its mandate, could support countries in implementing the 2030 Agenda and support the work of the high-level political forum on sustainable development to review progress on achieving targets related to food security and nutrition. A proposal for the engagement of the Committee in advancing the 2030 Agenda will be presented at the 43rd session of the Committee, to be held in Rome, in October 2017, for endorsement.

78. In April 2016, the General Assembly has declared 2016-2025 the United Nations Decade of Action on Nutrition (see resolution 70/259). The Decade is based on the Rome Declaration on Nutrition and its Framework for Action and, in its resolution, the Assembly called upon FAO and WHO to identify and develop a work programme for 2016-2025, including contributions from all stakeholders worldwide, using coordinating mechanisms such as the United Nations Standing Committee on Nutrition and multistakeholder platforms such as the Committee on World Food Security.

79. In order to better harmonize the work of the United Nations on nutrition and ensure that the United Nations system is fit for purpose, the United Nations Global Nutrition Agenda was launched in 2015 to align the work of nutrition-related United Nations agencies, including FAO, IFAD, UNICEF, WFP and WHO.[27]

80. The Scaling Up Nutrition movement, a country-led movement of multiple sectors and multiple stakeholders, is united in its mission to defeat malnutrition. As at July 2016, 57 countries and two States in India had committed to scaling up nutrition. Supporting these country-led efforts are more than 3,000 local, national and international civil society organizations, 169 national companies collaborating in the Scaling Up Nutrition Business Network, United Nations Networks for SUN being established in all 57 countries and the Scaling Up Nutrition Donor Network, bringing together bilateral donors, foundations and development banks to ensure that nutrition remains a development priority. Nutrition champions at all levels across the Movement are making an increasingly effective case for investing in nutrition, using evidence gathered through budget analysis exercises to advocate for more and better spending of public finance.

[27] United Nations Global Nutrition Agenda 2015, available from http://scalingupnutrition.org/wp-content/uploads/2015/06/UN-Global-Nutrition-Agenda-2015.pdf.

IX. Conclusions and recommendations

81. To optimize the role of agriculture in ensuring food security and improving nutrition requires a comprehensive approach that goes beyond interventions to increase agricultural productivity or raise incomes. It is more critical than ever to recognize the multifunctionality of agriculture as efforts are made to double agricultural productivity and the incomes of small-scale farmers, ensure sustainable food production systems and maintain agricultural genetic diversity. Coordinated action towards the sustainable production, processing and distribution of locally-grown edible agricultural produce can potentially ensure food security and nutrition, reduce loss and waste, improve land and soil quality, protect ecosystems and genetic diversity and strengthen resilience to climate change. To that end, the following recommendations are submitted for consideration:

(a) Implementation of social protection policies and measures to ensure access to food and nutritional security;

(b) Improvement of nutrition through leveraging food supply chains and scaling-up the use of biofortified staple crops;

(c) Increasing action to address hunger and malnutrition among the urban poor;

(d) Mainstreaming of nutrition and the promotion of healthy diets in national food and agriculture policies and investment plans;

(e) Expansion of efforts to increase the rate of exclusive breastfeeding during the first six months of life;

(f) Facilitating engagement and inclusive dialogue around policies and programmes for nutrition, agriculture and rural development, in particular with the partners needed to create an enabling environment for multisectoral approaches and effective scaling-up;

(g) Enhancement of access for small-scale farmers — especially women, youth, indigenous peoples and people living in vulnerable situations — to credit and other financial services, markets, secure land tenure, training, knowledge and affordable technologies;

(h) Strengthening of women's land rights and increasing their representation in formal and informal land-related institutions;

(i) Integrated management of soil and water resources;

(j) Empowerment of small-scale fishing communities to participate in decision-making processes and assume responsibility for the sustainable use of fishery resources;

(k) Reduction of food loss and waste to effectively support more sustainable food systems;

(l) Respect for the rights of indigenous peoples and recognition of the role of traditional knowledge and seed supply systems;

(m) Increased public and private investment in sustainable agriculture, land management and rural development in order to benefit local smallholders;

(n) Improvement of the functioning of markets and trading systems;

(o) Ensuring the collection of gender-disaggregated data and the compilation of gender statistics on a wider range of food and nutrition indicators.